

PUZZLEOPOLIS--The Secret of a Wonder City

YOU'VE heard of Puzzleopolis—an industrial wonder city that sprang up almost in a night, only Puzzleopolis is a fictitious name, assumed here for very good reasons which will later disclose themselves. The world thinks that its marvelous growth was due to the development of the enormous water power in the Niagara river below the falls, but the truth is—

But that is getting ahead of my story and I'll begin at the very beginning.

I was eating the bitter banquet of misplaced industry. After putting all my energy and inventiveness into aeronautical ventures, and having exploited a foreign airship that had promised more than it performed, here I was in America again, and penniless. Hope was no longer my friend and dejection was my boon companion as I waited that evening for the elevated train. An occult force seemed suddenly to lift me out of my moodiness and I noticed that the crowd, usually so indifferent to individuals at the rush-hour of a close and hot day, was watching someone. He was of ordinary build, but his figure indicated great intensity of action and enduring alertness, while his face was at once fascinating, pleasant and commanding.

Just then the train appeared and we made a rush for it. I was clutching at a swaying strap, when the man who had so absorbed attention touched my arm and exclaimed, "Hello, Homer Howard!"

AND then I knew him. He was the son of Selah Bradford, whose farm adjoined my fathers, and we had been seatmates in the district school. It was over forty years since he had gone away in a fit of anger, and not a word had I heard of him until this chance meeting. But he was just the kind of man his boyhood had prophesied he would be.

When he found I was without kith, kin or coin, Judah took me to dinner with him. Yet in spite of my delight in finding a friend at such an opportune time I was nervous. Judah Bradford filled me with an awe which I could not fathom, unless, indeed, he were in league with those phantom powers which common people have never met.

"Well, I have told you all about my sorry self. Where and what have you been up to since—"

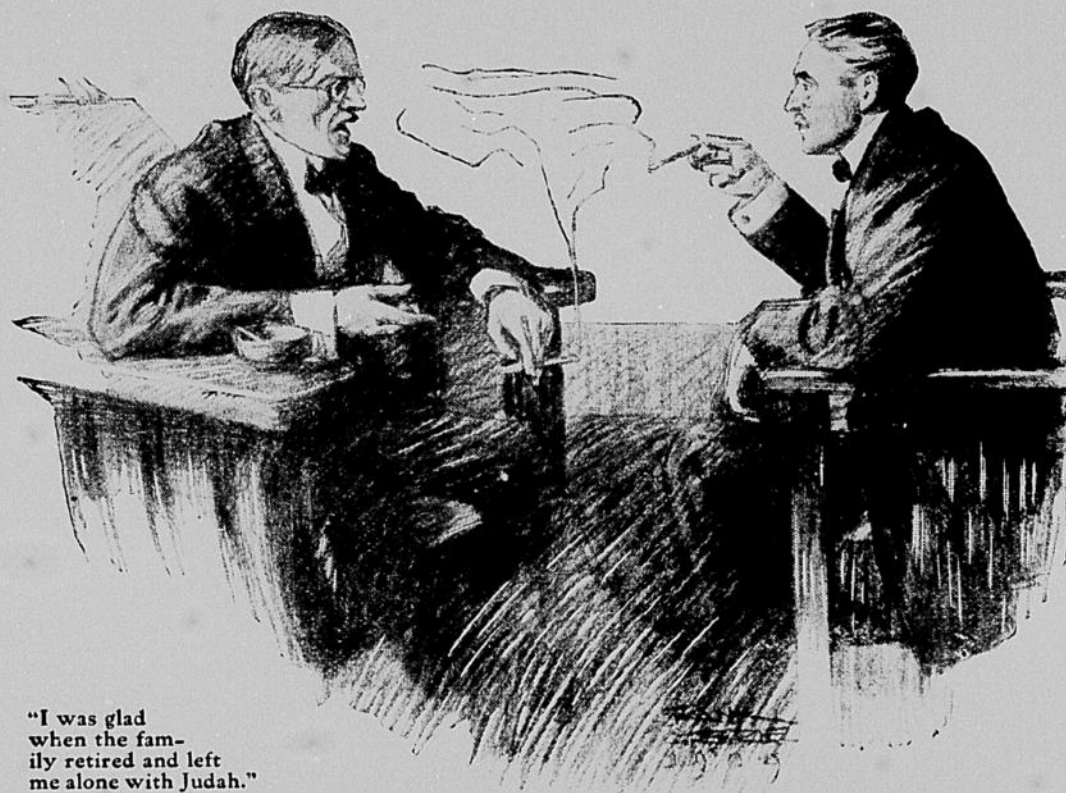
"Since I patented my mule-power churn?" he interrupted, and his hearty laugh made me lose at once my unaccountable dread of this old comrade. We were boys again; that laugh had lifted the mantle of two score years from us both.

"Yes, since you patented your mule-power churn. But, tell me, Judah, why you ran away then. Your father was only provoked, he was not relentless."

"I don't know just why I did leave. I felt a call to see the world and I just went. Do you remember that day in school when we were copying our writing lesson, 'Money is Power,' and mentioned in his speech that any one who could invent perpetual motion would become a millionaire?"

"Of course I remember it, and the perpetual motion machine you brought to school next day. You put it on the desk, a cigar box with a few holes in the top and a wheel from the toy cart fastened to a spindle projecting from the side. When you asked the dominie if you could start it, he looked queer and told you to do so if you could. So you lifted the cover, shut it down quickly, and the wheel began to spin with rapid jerks. 'Is this perpetual motion?' asked the teacher. 'Perpetual till the frog dies,' was your cry. Everybody was surprised and everybody laughed. You had placed a frog in the box, fixed a pin in the end of a stick, and with a string hung it over a pulley and tied it to the frog's leg. When the pin came down on the frog's back he jumped and thereby pulled it up again, back it would fall and prod him into another jump. The motion of the string was imparted to a ratchet connecting with the wheel outside, and made it whirl at a lively rate! How could any one forget that, Judah?"

WELL, that frog kicked me out of my orbit. If it hadn't been for that, Homer, I suppose I should still be a farmer in Ferrisford, Vermont. That idea of producing perpetual motion by means



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BY A. L. MCKENZIE

of irritation and reaction just haunted me. When I went to sleep it was always to dream queer combinations of incessant power. So when the treadmill broke down and father went to Burlington to get it fixed, I was absolutely possessed to rig up a big ratchet behind the mules and fasten it to the churn. After the milk was in the churn I dropped the ratchet against their vicious hind legs and the patent mule-power got under way. They kicked so hard that the joinings were melted and the whole gear of the mill was spoiled. Father came home to the worst looking dairy you could imagine. The churn cover had flown off, wheels and bearings and buttermilk were everywhere, and the mules were going faster and faster, though I was doing my best to stop them. "You fool of a boy," shouted father, "if you try any more of this Darius Green business you will ruin me! If you had sense enough to hoe potatoes instead of rigging up silly ways to save working I wouldn't be so ashamed of you. You are an expense and a nuisance. I wish you would never come into my sight again until you amount to something!" Poor father, I did vex him and I knew it, but I was so interested in devices that I couldn't keep them out of my head, day or night. Well, his words made me feel that I had better go away and amount to something if I could, and without being much disturbed or grieved, I went. Now I own Puzzleopolis, and I have just been to see father and made him rich."

"You own Puzzleopolis! A city! How did you get so much wealth? And why is the place called Puzzleopolis?"

Judah Bradford laughed at my excitement, and promised that if I would be his guest for a while at Puzzleopolis he would see that I had the answers to my questions.

IT was a few days later that we stepped off the Overland flyer in the station of a prosperous city. Just prior to reaching this depot my host had said, "Homer, go by yourself, do not be seen with me. Study the town for a week or so alone, find out what you can, then come to me. I may have to tell you most of the story, even then!"

The city was not unlike most of those of the middle west, except that the buildings were erected after a set of harmonious plans instead of in accord with individual whims, which so frequently result in the incongruous and grotesque. Banks, postoffice, depot, the mills, business houses and homes, while not alike in design or material, had yet a concord and proportion about them that gave rare unity to the streets. It was a beautiful and finished place. And if I had somehow expected an air of mystery to shroud its inhabitants, in this I was much disappointed. They were going about the customary ways of life, just like other people. There was as little to remind one of genii and Aladdin's lamp here as in home-spun, old Ferrisford.

I bought a souvenir card just to engage the

youth who sold them in conversation.

"Puzzleopolis is a queer name for a city. How did this place come by it?"

Being a pert youth, a flesh and blood American to the core, he grinned broadly and responded, "Search me! Ask Bill Taft or the king of Siam! I didn't name it!"

But an elderly gentleman who was passing by gave me the information I sought.

"Sir, this is a comparatively new town, about a dozen years old. This was only a wooded wilderness until they opened the big power houses at Niagara Falls. At that time a promoter, Judah Bradford by name, conceived the idea of starting an electric plant here, getting his power by line from Niagara and letting it out to those who could use it in manufacturing. He picked out this place because it happened to be on the railroad, was elevated and healthful, and the land was dirt-cheap. He has a rare faculty of interesting people in his ventures, and I was first to join him. He supplies the

electricity for heat, light and power, and after paying other expenses I go halves with him on the profits. This is a superb chance, because a great percentage of the cost of manufacturing goes into power and heating and lighting. Other men have built factories here on the same terms that were offered me, and now we have a soundly governed, well equipped city. Our schools and churches and public buildings are excellent. Our people are happy and progressive. Mr. Bradford is the mayor, and he is constantly planning improvements and bringing in new industries. When we were talking about a name for the new railroad station he suggested Puzzleopolis, and that suited everybody as well as any other name, perhaps. But what the puzzle is, if there is one, I never thought to ask. It may be because strangers wonder why there are neither clouds of smoke or chimneys here, though the factories are so large and numerous. But that is easy to explain. The electric current drives our mill wheels, pulls our street cars, lights and warms us. We do not need chimneys or smoke."

AND so did I spend a week, constantly hearing about Judah Bradford in connection with industry, finance and social life. Not one hint ever came to me that there was any mystery behind the scenes. I decided that if there was anything occult in their city or its origin, and if there were any hidden elements contributing to its visible prosperity, they would all be much surprised to learn it.

Then one evening I presented myself at Judah's house. He had a family of comely daughters, two of whom had graduated from Radcliffe, and one was preparing to enter that college in the fall. Mrs. Bradford was exceedingly gracious to her husband's boyhood chum, the girls sang and played, and altogether it was a delightful evening we spent together after the dinner hour. Yet I was glad when the family retired and left me alone with Judah. The secret of Puzzleopolis was eating into me as secrets unsolved often do. That was the one thing I wanted to know, and I was trembling with impatience to hear it.

"Homer, I first take your pledge not to reveal the identity of the city in connection with this story. Not one of its occupants is aware that it has a mystery concerning its origin and development. The people think that by reason of my immense dealings with the Niagara Power company I buy my electricity advantageously. Beyond that these busy, eager manufacturers do not consider the matter at all. They trust my integrity and business ability for my part of the bargain, and well do they fulfill theirs. But as a fact I have no dealings whatever with the Niagara Power company!"

Seeing my look of consternation he paused, and with an amused smile told me that he was not a wire-tapper, that he did not steal the miraculous fluid from anybody.

"No, I manufacture it myself by the old method of irritation and reaction, only I have found a better way of turning the wheels than the employ-

ment of frogs or mules, as you may easily surmise by the size of the motors in this city.

WHEN I left home I met a man who took a fancy to me, and agreed to pay my fare to the mines, whither he was himself going. Just as we were passing through this spot the locomotive blew out a cylinder-head, and my friend and I left the cars to stretch our muscles and explore around a little. When we returned we discovered that the train had continued on its way. We had not heard its warning whistle. Without food or shelter we were in a predicament, but my friend was used to adventure and the novelty pleased rather than frightened me. Chance led us to a cave, which proved to be of enormous proportions, and there we started a fire near the entrance and passed the night. Frequently I was awakened by a whistling noise which was wafted from the inner recesses, a noise like boiling water. In the morning we investigated. A small spring emptied on what looked like sulphur mixed with lime, and the moment it touched the solution it changed to hissing steam. At once there recurred to me the old dream of perpetual motion. But it was long years before I learned how to adjust this accidentally discovered principle to harness, though as we walked to the nearest town my head was full of visions.

"Through the struggle years of my mining life I thought time and again of that water turned to steam by natural chemistry. In the more fortunate years I ceased to think of perpetual motion until one day I was in a wreck out in Utah. The engine had left the rails near a wild crag, and the broken boiler was hurling vast columns of steam against this crag, but the moment the steam touched it back it came tumbling, congealed instantaneously to water. Hurriedly I examined the stone of which the cliff was composed. It was honeycombed with little cells, and the very touch of it seemed to wither my skin. There exuded from it an odor like strong ammonia. This stone had the unheard of property of converting steam to water. You may judge how excited I was, for I now held the full secret of perpetual motion. I knew a chemistry of unending, endless and unlimited mechanical propulsion. That was a supreme moment, the joy of it so intense that it almost blended into pain, just as the sky blends with the ocean on the horizon's edge.

"I acted at once. With my hoarded savings I bought a mighty turbine, built after my own designs, with double escapements to act with water

and steam. This turbine was made for me in Chicago, and though the firm was used to making huge machinery, the men were fairly astounded at its colossal dimensions. "Where do you expect to get a Niagara to run this ninth wonder of the world?" asked one of the engineers. That gave me an idea, and I answered that presumably Niagara would some day be running just such wheels. As the initiated knew that such plans were even then on foot, the Chicago people believe to this day that my turbine is churning by the force of the falls.

"I had the turbine shipped in cases, and the freight hands were not startled to receive orders that the cases were to be unloaded in the wilderness. They had seen too many towns spring up over night to ask any questions when they discharged the freight here. But the ticklish thing was to keep the carpenters and machinists from prying into my secret when they came to set the turbine up in the cave. I made it a point to appear odd and abstracted and to say queer things. The men decided, so the foreman told me in substance, though he did not use very elegant language, that I was a harmless lunatic, and that so long as I paid the bills liberally, the foolishness was all mine.

AT length the turbine was in place. It was set horizontally and encased in strongest steel. Inside the case a platform was arranged and covered with tons of stone and on the floor below we had placed quantities of the limy sulphide which was so abundant in the cave itself. My mechanics now installed twelve dynamos of the utmost capacity in the cave, and connected them with the thousand-ton fly-wheel that was on the projecting shaft of the turbine. Then we laid great electric cables in a conduit and brought them to the locality where I had planned to have the factories built. The entrance of the cave was concealed by a house which was constructed over it, and which is now known as my experimenting shop. Then I paid the men a bonus and sent them on their way rejoicing.

"With something of apprehension, in spite of the confidence I had in my calculations, I turned the faucet which connected the little spring with the wheel-box. It touched the floor, met the lime-sulphides, became steam and went up with a whirl until it reached the ammonia-stone, from whence it came hurtling down in the form of water on the other side of the turbine. My expectations were fulfilled. But it was weeks before there had

flowed sufficient water from the spring to generate the immense energy required to set the machine in motion. Then it began so reluctantly to move, hardly revolving once in a whole day, but all the time it was accumulating speed. Faster and faster it moved, until the huge fly-wheel spun with frightful rapidity. I turned off the water and was rejoiced to read on the indicator that the speed remained constant. I had perfected the grand invention of civilization.

"You know the rest. I went in partnership with such reliable manufacturers as I could interest, and I have now built and dominate a city which is destined to become the metropolis of the middle west. I have the very digestion and propagation of energy, perpetual motion, unlimited power through the irritation and reaction of certain chemicals and water. These natural agents never lose their potentiality, and do not have to be renewed, as at first I thought would be the case. The interaction is perfect. To get more power I pay a visit by night to the cave and turn on a little more water. The upward rush of the hissing steam and the downfall of water give a double impetus which is almost irresistible.

"So here is my secret, understood by no other man in the world to be a secret, revealed in its fullness only unto you, my old chum. Don't you think you and I can make a successful flying ship through the application of this chemical force of mine? We can work together, you putting in your knowledge as a professional aeronaut, I co-laboring in the construction of the engines. Perhaps you will reach the North Pole and the South one too, before Walter Wellman gets started."

Here ended the narrative. I sat in a half-haze, meditating that the day of alchemy and marvels is still with us. There was a gleam of joy beaming through my haze, giving me new hope that some day I shall be king of the air, in spite of all my previous failures.

ON the following morning I was admitted into the hidden cave, and I know beyond peradventure that the motive force which drives the great factories of that city and lights and heats it is nothing else than the chemical combination of ammonia-stone, water, and a complex solution of sulphur and lime, most cleverly applied to machinery.

My friends who read this, some of you may be living in the very place whose origin is here described, without knowing that there is anything unusual about it. Matter of fact citizens, will you ever know that Niagara is not your servant? It is doubtful. If in the beginning you had been informed whence the current was derived, the mystery of it might have been disconcerting, and you would have been unlikely to risk your capital in putting up factories dependent upon it. Were you to be told the whole secret now you would go to making electricity for yourselves and Judah Bradford would cease to have an income from his discovery.

Puzzleopolis? Well, that is the equivalent of the name, not the spelling of it. Indian nomenclature was borrowed from when the town was christened. But there it is today, making cereals, woollens and many other wares, unconsciously owing its existence and prosperity to the Vermont boy who left home because his mule-power churn was a failure in the eyes of his practical father.

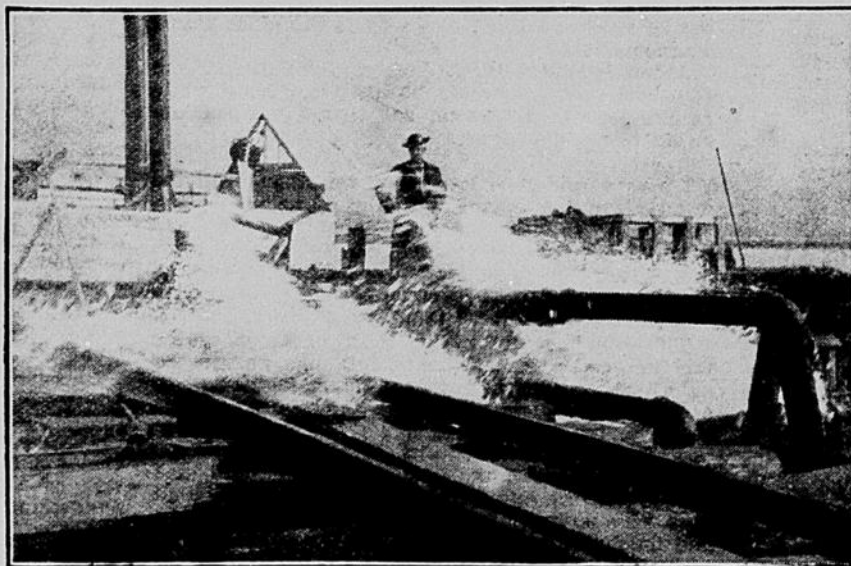


"I presented myself at Judah's door."

Building the World's Biggest Dam--By W. T. Walsh

IN the process of digging a new channel in the Detroit river fourteen miles below the city of Detroit, government contractors have built the biggest coffer or "dry" dam ever constructed. It is more than a mile in length, a third of a mile in width and it has been pumped, to the very bottom, as dry as a bone, while the whole might of the river pressed and crowded against the walls of stone and clay. The feat was thought by many veteran contractors to be impossible, especially as a portion of the work had to be carried on under exceptional conditions which required that navigation in the meantime must not be interfered with.

Ever since 1874 the federal government has attempted to improve what is known as the Lime Kiln crossing in the Detroit river. Year by year the sailors of the Great Lakes have found it more difficult to pass this point. Wrecks and disasters have been innumerable. This state of affairs has been augmented by two things—the constantly increasing traffic and the huge dimensions of the vessels now engaged in the passenger and freight business of the lakes. Today freighters sail



An air lift through which 50,000,000 gallons of water flowed daily.

through laden with 10,000 tons of iron ore or 400,000 bushels of wheat. More tonnage passes in a season over the Lime Kiln crossing than enters

any of the ocean ports of the world in a corresponding length of time.

Stony Island, a bit of marshy land several acres in extent, was used as a base for the new operations. The area of a third of a square mile was first laid off. Then a wall forty feet through at the base and designed to rise ten feet above the surface of the water, when completed, was begun. The force of the current, the wash of passing vessels, very greatly impeded the workmen.

After the completion of the wall—a matter of several months' continual struggle—the real problem presented itself: Would this wall stand the pressure of the river against its sides when the counteracting pressure of the water within the dam were removed? The work, however, had been too well done for worry. Within ten days after a combination of pumps, with a capacity of 50,000,000 gallons, every twenty-four hours, had begun their operations, 130 acres of land could be crossed dry-

shod. Old mariners, from the decks of their vessels, stared amazed at the great gap in the course of the Detroit river.